Race, Wage Growth, and the Cumulative Effects of Incarceration

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Abstract

Spending time in prison has become an increasingly common life event for low-skill minority men in the U.S. The Bureau of Justice Statistics now estimates that one in three Black men can expect to spend time in prison during his lifetime. A growing body of work implicates the prison system in contemporary accounts of racial inequality across a host of social, economic, and political domains. However, comparatively little work has examined the impact of the massive increase in the prison system – and growing inequality in exposure to the prison system – on racial inequality over the life course. Using a unique data set drawn from state administrative records, this project examines how spending time in prison affects wage trajectories for a cohort of men over a 14-year period. Multilevel growth curve models show that black inmates earn considerably less than white inmates, even after considering human capital variables and prior work histories. Furthermore, racial divergence in wages appears to increase in quarters after release from prison, and blacks receive fewer returns to previous work experience than whites. The differential effect of incarceration for blacks and whites broadens our understanding of the sources of racial stratification over the life course and underscores the relevance of recent policy interventions in the lives of low-skilled minority men.

A central concern in the study of racial stratification is the extent to which racial gaps in wages and exposure to poverty change over the life course. Although direct assessments of within-cohort changes are relatively rare, available longitudinal research indicates that white men begin their work careers with higher initial wages than non-white men (Rosenfeld 1980), and this racial disparity in wages gradually widens over the life cycle (Hoffman 1979). Recent estimates using panel data from the NLSY find that the wage gap among Black and white men increases from 15% at age 20 to 28% at age 33 (Wu 2006). Given these patterns, it is perhaps not surprising that the odds of experiencing poverty during later adulthood are significantly higher for blacks and those with less education (Rank and Hirschl 1999).

Prior research has examined how cognitive differences, educational investments, and differential work experience explain racial inequality in wages, wealth, and exposure to poverty. Increasingly, however, scholars have argued that the massive build-up in the criminal justice system since the 1970s is another key determinant of racial inequality because it has disproportionately affected racial minorities and low-skill men. The relative rate of incarceration between blacks and whites has increased dramatically in recent history: in the 1930s, blacks were about 3 times more likely to be incarcerated than whites; in the 1990s, the ratio increased to more than 7 times that of whites (Duster 1997). Among recent cohorts of black high school dropouts, imprisonment is more common than marriage, and nearly 60% can expect to spend at least one year in prison before they turn 35 (Pettit and Western 2004).

Recent research on the consequences of incarceration for labor market outcomes indicates that criminal offenders and prison inmates face poor market prospects upon release, providing further evidence that differential exposure to prison by race may contribute to racial inequality. However, we still know little about how spending time in prison affects wage growth

over time for black and white former inmates. We argue that the recent upsurge in the criminal justice system – and its disproportionate effects on low-skill minority men – calls for further examination of the determinants of racial inequality over the life courses of those at risk of prison.

How does the experience of incarceration affect wage trajectories for black and white former inmates? Do the labor market consequences of incarceration differ for blacks and whites, net of accumulated work experience? If so, do these differences in the experience of incarceration help explain racial stratification in wages over the life course? We begin to explore these questions in this paper. We move beyond cross-sectional research on racial stratification by exploring work and wage dynamics over time for a cohort of men who are admitted to and released from prison over a 14-year period. Drawing on a unique collection of administrative panel data on prison stays, education, and work in the legitimate labor market, we explore the relationship between incarceration, accumulated work experience, and wage trajectories via growth curve (or multilevel) modeling and investigate whether racial differences in the impact of incarceration explain racial trends (e.g. convergence or divergence) in wages over time.

INCARCERATION, RACE, AND THE LABOR MARKET

Some researchers suggest that federal policy can influence racial stratification in positive ways. For instance, civil rights legislation of the 1950s and 1960s was consistently found to have progressive effects on the relative economic standing of black men, and some argue that equal employment opportunity lead to convergence in employment and wages between black and white men in the 1960s and 1970s (Burstein 1979, Heckman 1989; Darity and Myers 1998, 44-45). Despite these potentially positive interventions, debate remains about whether trends in the racial wage gap are diverging or converging recently (e.g., Chandra 2003). However, it is clear

that racial disparities in economic standing persist today (Darity and Myers 1998), and there is evidence that the racial wage gap widens *within specific age cohorts over the life cycle* (Wu 2006). This wage divergence within cohorts has been traced to differences in pre-market factors (e.g., cognition), investments in education, and differences in accumulated work experience (Antecol and Bedard 2004). Recent research finds that differential work experience by race is arguably the key determinant of wage inequality over the life course, trumping the effects of pre-market factors, and investments in education, on wages in later life (Antecol and Bedard 2004).

Scholars increasingly argue that the punitive turn in state and federal criminal justice policy beginning in the 1970s marks another important intervention, which has lead to *increasing* racial inequality (Western 2006). In particular, differential risks of incarceration by race may be essential for understanding racial inequality over the life course. Although spending time in prison was reserved historically for violent or chronic offenders, changes in criminal justice policy—including the widespread adoption of mandatory minimum sentences, increases in sentence length, and automatic parole revocation—have increased the number and percentage of prisoners serving time for non-violent property and drug offenses. As spending time in prison typically interrupts participation in the legitimate labor market, incarceration may have adverse impacts on the accumulation of work experience and wage growth potential.

Thus, investigating the effects of spending time in prison on wage growth may help us understand racial divergence in wages. Relatively little research has examined the cumulative effects of incarceration on wage trajectories within cohorts over the life course. Moreover, the few studies that have been able to investigate relatively long-term incarceration effects do not investigate the possibility that effects may differ in important ways for blacks and whites.

The labor market consequences of prison

Not all criminal justice sanctions incur a penalty on the job market, but the most severe sanction—prison incarceration—is found generally to have strong negative effects immediately after release. Estimates of the negative impact of prison time on earnings range between about 10 and 30 percent (Western, Kling and Weiman 2001). In addition, while wages tend to recover with time out of prison (Pettit and Lyons 2007), research finds that ex-inmates experience slower earnings growth after release compared to other young men whose wages rapidly increase through their twenties and thirties. Prison is thought to channel young men into secondary labor market jobs characterized by high turnover rates and few returns to skill or seniority (Bushway 1996; Nagin and Waldfogel 1998; Western 2002).

Theoretical explanations for the relationship between incarceration and post-release employment and earnings typically emphasize human capital, stigma, and criminal embeddedness. The neo-classical economic model of crime (Becker 1968) considers crime as a time-allocation decision, and suggests that criminals will have limited time for participation in the legitimate labor market and thus perform poorly. To the extent that contact with the criminal justice system takes one out of the legal labor market, incarceration may contribute to the erosion of human capital and diminish an individual's ability to qualify and compete for stable employment.

A second model is derived from the central tenants of labeling theory (e.g. Becker 1963), which holds that individuals can be typed or labeled as "essentially deviant" and untrustworthy by formal agents of the criminal justice system. Others, including potential employers, may react to this label as a "master status" that precedes the existence of any secondary or more positive characteristics of an individual (Becker 1963). Research suggests that at least some employers

use criminal history records when making hiring decisions. Holzer (1996) reports that between 30 and 40 percent of employers sampled in a survey of five major U.S. cities checked criminal history records of their most recently hired employee, and about 65 percent stated they "would not knowingly hire an ex-offender" regardless of the offense, preferring instead to hire other marginalized workers such as welfare recipients over ex-criminals. Experimental studies using criminal and non-criminal job applications also provide support for the stigma of incarceration, suggesting that employers discriminate against applicants with criminal histories (Boshier and Johnson 1974; Schwartz and Skolnick 1962; Pager 2003).

A third explanation for the effects of criminal justice contact and criminality in general on labor market outcomes focuses both the human and social capital of individuals embedded in criminal networks. Hagan (1993) argues that past criminality embeds youth in criminal networks, which, rather than the stigma of criminal justice contact, directly causes future unemployment (Bushway 1998). Early adolescent criminality and embeddedness in criminal networks may leave delinquent youths bereft of the necessary human and social capital to participate successfully in legal employment.

These perspectives, therefore, predict a negative incarceration effect on wages and employment. We must be clear, however, about defining incarceration effects in wage *trajectories* over time. On the one hand, a negative effect could mean that ex-inmates earn lower wages after incarceration than before. However, given that most men experience some wage growth during prime working ages, a negative wage trajectory over time after incarceration may be unlikely. On the other hand, the perspectives noted above imply that the wages of ex-inmates may increase more *slowly* than the trajectories of comparable individuals, leading to divergence over the life cycle (Western 2002). The key question then becomes whether post-release wage

trajectories for ex-inmates differ from the wage trajectories of *comparable individuals who do not experience incarceration* (Bushway, Stoll, and Weiman 2007). Although we recognize the difficulty in selecting an appropriate comparison to the inmate sample we examine, we attempt to explore these issues in additional analyses below.

The negative relationships between incarceration and wage trajectories hypothesized by each of these perspectives, however, are generally *race-neutral*. A major goal of this study is to explore whether the experience of incarceration differs for blacks and whites, and whether this variation helps explain racial disparities in wages over the life course. Although research on race differences is quite limited, there are reasons to suspect that the labor market consequences of imprisonment do vary for whites and blacks. For one, we might expect blacks to be relatively more disadvantaged by incarceration and less able to recover from prison stays in the long term than whites. This relative disadvantage for blacks may be due to racial differences in accumulated work experience before incarceration or involvement in jobs with varying levels of turnover.

The combination of minority status and criminal record may also intensify stigma and employment discrimination for blacks (Pager 2007). Drawing on social psychological research on the activation and application of stereotypes, Pager (2007: 152) notes that the more closely an individual fits a stereotype along multiple dimensions, the more powerfully the stereotype is activated. Thus, the interaction between racial minority status and criminal record may act to confirm and intensify stereotypes about criminality and diminish the relevance of more positive characteristics. From the point of view of employers, the confirmation of racial stereotypes may encourage discrimination in the hiring process (Pager 2003; 2007), or in the allocation of workplace rewards, including promotion, starting wages, and yearly raises. In contrast, because

whites may not fit multiple dimensions of the prototypical criminal, employers may be more likely to overlook a criminal record, or be more persuaded to give whites a second chance. Criminal records for whites may be more likely attributed to "an isolated incident rather than an internal disposition" (Pager 2007: 153; see also Bridges and Steen 1998). Insofar as the relative price of incarceration is greater for blacks than whites, incarceration may contribute to *divergence* in black-white wages after release.

Alternatively, dramatic differences in the risk of incarceration by race may imply the opposite: racial gaps in wages for former inmates may actually *converge* after release from prison. High rates of incarceration among black men may make it difficult for employers to distinguish black ex-convicts from other blacks. Consequently, employers may view all black men, especially low-skilled black men, as potential criminals (e.g., Holzer 2003). If as race serves as a "master status", all blacks will experience lower returns in the labor market than we expect given observable human capital, and incarceration will not necessarily have any *additional* effect on employment or wage outcomes (Pettit and Lyons 2007). In contrast, among whites incarceration is less common and employers may view exposure to the criminal justice system as a clear indicator of untrustworthiness, low productivity, or future criminality. Therefore, white ex-convicts may experience more salient discrimination associated with spending time in prison because employers distinguish white ex-inmates from non-inmates (on the basis of time spent in prison, references from corrections officers, work experience gained in prison, etc.) and adjust employment offers and wages accordingly.

The limited research on racial variation in incarceration effects finds evidence of differences in the effect of incarceration on employment. Evidence shows that blacks are much less likely to be called for interviews than even white ex-convicts, all else equal (Pager 2003).

When examining racial differences in post-prison employment, Meyers (1983) finds that blacks are more responsive to post-release work incentives than whites and suggests that employers may find black ex-offenders indistinguishable from black non-offenders. However, very few studies examine racial differences in the impact of incarceration on wages. One notable exception is Western's (2002) analysis of NLSY data, which finds that the *relative* impact of incarceration on wage growth is somewhat higher for whites than for blacks, perhaps because wages grow more slowly for blacks than whites in general, regardless of incarceration.

Using a rich set of administrative data, we contribute to the small but growing literature on the consequences of incarceration by investigating the effect of incarceration on differences in black-white wages over the life course. We pay particular attention to whether the effect of incarceration on wage trajectories varies by race. As cumulative work history is typically an important determinant of wages, we also explore the relationship between employment stability and wage growth, and examine how differences in accumulated work history by race affect wage inequality. We suspect at least some of the incarceration effect is through changes in actual work experience associated with spending time in prison, but incarceration may have additional independent effects on wage growth through adulthood.

DATA

To investigate the relationship between incarceration, race, and wage growth, we compile administrative data from the Washington State Department of Corrections and Unemployment Insurance (UI) records. Previous research on the effects of incarceration on labor market outcomes that rely on survey data have not always been able to isolate the effects of spending time in prison from other factors that jointly affect the probability of incarceration and poor labor market fortunes. Recent policy changes in the state of Washington allow us to collect

a rich array of covariates that provide for a closer examination of alternative explanations for post-release effects on wage trajectories.

We began with a sample of men who were admitted to and released from a Washington state prison between 1990 and 2000. We link these corrections data to over 14 years of demographic, education, and earnings UI records from 1988 through 2002. Over 85% of the DOC sample was located in UI records, generating a sample of 19,184 individuals who spent time in Washington State prisons in the 1990s and were observed, at least once, in UI-covered employment. The data are organized into quarterly observations. Each quarterly observation indicates if the individual was incarcerated in the quarter and employed in a UI-covered job. We calculate average hourly wages in each quarter employed. Observations also include information on race, education, and criminal severity as well as conditions of most recent incarceration. Our data collection strategy ensures that we can compare pre- and post-incarceration employment experiences and wage trajectories: we observe earnings data for individuals *at least* 2 years (8 quarters) *before* their first complete stay in a Washington state prison in the decade, and *at least* 2 years *after* their release from prison.

From our larger sample of inmates, we select a cohort of black and white men who are between 18 and 24 years old at the first year of our observation window (1988), and follow them until 2002, when their ages range from 31-47. We thus concentrate on wage trajectories over prime working ages for these two racial groups, resulting in a sample of 2215 white and 710 black men. The vast majority of inmates in our sample (78.5%) serve only one prison term between 1990 and 2000, and we observe their wages before and after their prison stay through the first quarter of 2002. For inmates who are readmitted during our observation window, we only include quarterly information up to a new prison stay. That is, we restrict our analyses to

quarters before and after the first observed incarceration in an attempt to disentangle the effects of age from the cumulative effects of multiple prison spells (which, in our sample, is strongly correlated with age).

Wages

Hourly wages are constructed by taking quarterly earnings divided by reported number of hours worked. Wage data are in constant dollars indexed to 1995. In approximately 4 percent of cases where there are positive quarterly wages, the hours worked data are either missing or misreported. We find few systematic differences in the misreporting of hours worked, and we exclude all quarterly observations with zero reported wages. We also limit our analysis to individuals with at least 2 observations with positive reported wages before and after incarceration. Table 1 shows average hourly wages for blacks and whites, including average first observed wages and last observed wages. Although first observed wages are similar for blacks ($5.44) and whites ($5.35), whites show considerably more average wage growth between first and last employment observation (+$6.42 compared to +$4.31 for blacks).

We realize that restricting our analysis to UI-covered earnings limits the generalizability of our results to the effects of incarceration on wage trajectories in the formal sector. We are unable to make claims about the impact of incarceration on other forms of economic activity. Nevertheless, UI-covered jobs represent jobs in the formal economy that carry with them employment protections, including unemployment insurance, and thus represent an important indicator of men's attachment to the paid labor force.[1]

[1] Nevertheless, reliance on UI-covered jobs may still bias our estimates of wage trajectories and employment experience, although it is difficult to have strong a priori expectations as to the direction of this potential bias. On the one hand, administrative records may understate employment and earnings, particularly for young men with a prior arrest (Kornfeld and Bloom 1999). UI reports understate the incomes of those in day labor and other informal work (uncovered rather than out-of-state jobs). If ex-inmates are moving from work that is covered by UI into work

We estimate wage trajectories as a function of incarceration, human capital (including work experience), and other demographic variables. Conceptually, we distinguish between time-variant and person-constant measures.

TABLE 1 HERE

Time-variant measures

To capture previous work experience, a key predictor of wage trajectories, we measure the proportion of previous quarters that an individual was reported working in UI-covered employment. An individual is coded as being employed if he has positive reported earnings within a quarter. We measure the time trend in wages in two ways. First, to capture the overall effects of age, we measure the *change* in chronological age in quarters. Specifically, we compute age in our first quarter of observation (in 1988) as current age minus 18. Thus, an individual aged 18 in 1988, for example, takes a value of 0 in the first quarter, 1 in the second quarter, and so on. Given the strong relationship between age during prime working years and wage growth, we expect this parameter to be significant and positive. To measure the wage trend after release from prison, we indicate the amount of time, in quarters, since release, which takes on a value of 0 in all quarters prior to release. This measure captures the *additional* effect of having a criminal record on subsequent wages, net of the overall age trend. Including both a general measure of change in age and a measure of time after incarceration allows us to compare earnings slopes before and after release from prison.

We also control for industry of employment. Table 1 shows the distribution of inmates by industry in the last observed job. Inmates are concentrated in service, construction, retail, and manufacturing jobs. This is especially notable for black inmates, with 68% concentrated in

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that isn't, reliance on UI records may lead to an overly pessimistic estimates of incarceration effects. On the other hand, if ex-inmates move from uncovered to covered jobs, reliance on UI records could lead to overly optimistic estimates of incarceration effects.

service and retail, and another 20% in manufacturing or construction. We do not detect any significant shifts in the distribution of ex-inmates across industries after incarceration. Finally, to account for yearly fluctuations in the economy, we control for year (1988-2002).

Time-invariant measures

We measure information about the conditions of confinement and various demographic characteristics as time-invariant (person-constant) variables. Our models include information on length of incarceration, offense type (violent, drug, property, or other), whether the individual was involved in a work-release program during incarceration, and race and education. The average length of stay in quarters is 6.41 for blacks and 6.13 for whites.[2] Thirty-six percent of black inmates and 43 percent of whites participated in work-release programs while incarcerated. We do not have specific information about the nature of such programs in Washington State, although we do find that participation is more common among older and longer-serving offenders, and those with particularly poor employment histories. We expect participation in work-release programs may contribute to improved wage trajectories, although if inmates who participate in these programs are particularly disadvantaged, any positive effects may be offset by existing liabilities.

The sample is relatively poorly educated. More than a quarter of black and white inmates are high-school dropouts, and only a fraction has received some college education.[3] Although some inmates acquire additional education while in prison, we do not have reliable time-varying

[2] By including only inmates incarcerated and released between 1990 and 2000, we may under-represent offenders with longer prison sentences. However, the median sentence length for our sample approximates that found in the state as a whole. While we clearly under-observe severe offenders with long prison sentences, our data is representative of non-violent drug and property offenders who typically serve shorter prison stays than violent offenders.

[3] For about 10% of our sample, education data is missing. To minimize loss of cases to missing data, we flag missing education data and include this as a separate variable (see Table 1).

measures of education attainment so we treat education as constant across individuals during our window of observation.

ANALYTICAL STRATEGY

To examine the relationship between wage growth and incarceration, we employ multilevel modeling techniques, also called growth curve modeling (Singer and Willet 2003). We conceptualize our longitudinal measurements as having a hierarchical structure in which multiple quarterly observations (level 1) are nested within persons (level 2). The time-variant characteristics noted above, including our measures of time (change in age and time since release from prison), are indicated as level-1 variables, whereas time-invariant, person-constant characteristics are denoted level-2 variables.

This modeling strategy accounts for the interdependence of wage observations over time within individuals and does not require individuals to have the same number or spacing of measurements in the observation period. The latter advantage means that multilevel modeling uses all measurement occasions for each subject, and is therefore "superior to approaches that define the dependent variable as the growth in wages between two fixed points in time" (Fuller 2008: 165). Random-intercept multilevel regression (Snijders and Bosker 1999) also estimates average growth trajectories and individual variation around the mean.

For the models presented below, we pool black and white inmates together and explore the effect of race (Black) on wage trajectories. An alternative strategy is to disaggregate by race, estimate separate models for black and whites, and compare coefficients across models. Doing so results in substantively identical conclusions to those presented below; we opt for the pooled model for ease of presentation.

Multilevel regression simultaneously estimates two equations, one modeling level-1 characteristics within persons, and the other modeling level-2 variation between individuals. We can express the level-1 model of wage trajectories as:

$$\ln \text{WAGE}_{ti} = \pi_{0i}\,\text{INTERCEPT}_{ti} + \pi_{1i}\,\text{AGE GROWTH}_{ti} + \pi_{2i}\,\text{QUARTERS SINCE RELEASE}_{ti} + \pi_{3i}\,\text{WORK EXPERIENCE}_{ti} + \pi_{4i}\,\text{YEAR}_{ti} + \pi_{5\text{-}11i}\,\text{INDUSTRY}_{ti} + r_{ti} \quad (1)$$

The residual (r_{ti}) captures the unmeasured quarter-to-quarter variation in wages for a given individual, often referred to as the level-1 random effect. The second equation takes individual variation into account in a level-2 model, and captures the influence of measured and unmeasured person-constant variables on the intercept. More specifically:

$$\pi_{0i} = \beta_{00} + \beta_{01r}\,\text{BLACK}_{ri} + \beta_{02r}\,\text{EDUCATION}_{ri} + \beta_{03r}\,\text{QUARTERS INCARCERATED}_{ri} + \beta_{04r}\,\text{OFFENSE TYPE}_{ri} + \beta_{05r}\,\text{WORK RELEASE}_{ri} + u_{0i} \quad (2)$$

The residual (u_{0i}) can be viewed as a random-intercept variance, or the systematic deviation from the average intercept for a given individual, with an assumed mean of 0.

The model also allows for testing cross-level interactions (i.e. between level 1 and level 2 variables). Of central interest to us is whether time since release from prison interacts with race. We also explore cross-level interactions between race and other time-variant measures, including work experience, age, and year.

RESULTS

Before examining multivariate wage growth models, Figure 1 presents unadjusted mean wages by race for our cohort of men (who were between ages 18-24 in 1988). The figure charts wage trajectories for 8 quarters (two years) before and after the first observed incarceration stay.

Despite some fluctuation in average wages, blacks consistently earn lower hourly wages than whites before and after incarceration. Interestingly, the earning trend prior to incarceration, while positive in slope, is somewhat *flatter* than earning growth after incarceration for both blacks and whites. That is, both blacks and whites appear to have steeper earning trajectories after release from prison than before they experience incarceration. This may partly reflect the general trend for increased wage trajectories over the life course, especially during prime working ages. However, the graph suggests a widening wage gap for blacks and whites after incarceration for this cohort. In particular, in the quarters after release from prison, the earning trend for whites appears steeper than the earning trend for blacks, suggestive of wage divergence over the life course.

FIGURE 1 HERE

We next explore whether these patters hold while adjusting for relevant time-constant and time-variant variables (especially age and prior work) in multilevel models. Table 2 presents multivariate models predicting log hourly wages for our pooled cohort of inmates. Looking first at model 1, we see a positive general trend for age (age since 1988) and year, as well as a positive trend for wage growth after incarceration (quarters since release). Even after accounting for wage growth due to age, the earnings slope increases in quarters after release from prison, as suggested by Figure 1. The time-invariant (person-constant) estimates reveal that blacks earn significantly lower hourly wages than whites on average, net of controls for industry, education, offense type, and sentence length. To explore the degree to which racial differences in wages are a product of differences in accumulated work histories, model 2 controls for prior work experience. As expected, prior work experience significantly predicts wage trajectories. Prior work experience also explains a substantial proportion of the black-white gap in earnings: net of

prior work experience, the coefficient for Black is reduced about 28% (from -.067 to .048). However, the race effect is still significant and negative, suggesting that prior work experience does not completely account for differences in wage trajectories by race. Likewise, the coefficient for quarters since release is cut in third, but is still positive and significant after controlling for work experience.

TABLE 2 HERE

Cross-level interactions with race and time-variant measures test whether the effects of incarceration, prior work experience, age, or year vary by race. Model 3 presents two significant cross-level interactions (for parsimony, non-significant cross-level interactions are removed from the model). The negative coefficient for black*quarters since release indicates divergence in post-release wage trajectories for blacks and whites. Black wages increase at a slower rate than white wages after release from prison, net of the positive age trend (which does not vary significantly by race). This generally confirms the post-release trends illustrated in Figure 1 for unadjusted wages. Furthermore, although more stable work histories predict higher earnings slopes for both blacks and whites, blacks appear to have lower returns to prior work experience than whites.

Table 2 also presents the effects of education, length of confinement, offense type, and participation in work-release programs while in prison, all treated as person-constant measures. The more fully specified model 3 shows few effects for offense type or conditions of confinement. Educational attainment, however, is significantly related to wage growth as expected, with individuals earning college or high school credentials experiencing more wage growth than high school dropouts. We also tested interactions between race and these person-constant measures, but generally found no evidence of race differences. The exception was that

blacks received fewer returns to a college education than whites ($p < .1$). However, this effect disappears once controlling for the interaction between race and prior employment experience.

Additional Analyses

Thus far, our analyses of longitudinal inmate earnings suggest that incarceration may differentially disadvantage blacks compared to whites. Post-release wages increase at a slower rate for blacks than for whites, indicating a widening in black-white wage gaps over time after incarceration. However, in assessing a generalizable "causal effect" of incarceration, researchers confront the difficulty of obtaining an appropriate non-inmate comparison group to an inmate sample (Bushway, Stoll and Weiman 2007). Although our inmate data allow us to examine wage trajectories for inmates by race, we can say less about the trajectories of *similarly situated* men who do not experience incarceration. We attempt to address this issue by matching inmates with a comparison sample of non-inmates with data from the State Board of Community and Technical Colleges (SBTC), which gathers data on all GEDs awarded in Washington.

We began by identifying individuals in our sample of male inmates who completed a GED. We found 5862 of our inmates in the SBTC GED database. We then matched these inmates who completed a GED with men in the SBTC database who we do not observe in state correctional records during our window of observation (1990-2000). We match on the basis of closest available wage, age, date of GED, GED score, and race where available, and follow the employment histories and earnings trajectories of inmates and their matched counterparts over the same period of time.

This strategy allows us to compare the labor market experiences of inmates with non-inmates with similar cognitive skills, and potentially draw comparisons to analyses conducted with survey data that include inmates and non-inmates (e.g. Freeman 1991; Western 2002).

Unfortunately, race information is missing for over 60% of the non-inmate match sample, which precludes any comparison of race differences in trajectories with the results presented in Table 2. Furthermore, descriptives of these data show considerable differences in wages and employment experience between the inmate and non-inmate sample. Thus, despite matching on some key variables, it appears that there are unobservable differences in this sample that affect labor market outcomes in ways that we cannot capture with available measures. Given these data limitations, the comparative analyses reported below should be interpreted with caution. Nonetheless, evidence that wages for inmates diverge after incarceration compared to those who do not experience incarceration would be consistent with claims about a generalizable negative effect of incarceration.

A total of 888 inmates and 942 matched counterparts, who are between ages 18-24 in 1988, reported positive earnings at least once before and after incarceration, or before and after the equivalent time period for the comparison sample that does not experience incarceration. To compare wages after incarceration for inmates with their counterparts, we take information from the inmate on time spent in prison and time since release and mark equivalent time periods for their matched, non-inmate counterpart. We proceed with multilevel models similar to those presented in Table 2 predicting log wages over time, except that we leave out other incarceration variables (offense type, work release) not relevant to the comparison sample.

TABLE 3 HERE

Table 3 presents multilevel regressions predicting quarterly log wages for inmates who earned a GED and their matched counterparts. Controlling for previous work history, time trends, and industry, the inmates earn considerably less than non-inmates (b = -.056), even after matching on relevant characteristics. In reduced models not shown, accumulated work

experience explains a substantial proportion of the difference (almost 40%), but the remaining inmate effect net of work experience is large and significant. The general wage trend over age is positive for both inmates and non-inmates, although the additional post-release trend is positive only for non-inmates. The negative interaction between inmate and quarters since release indicates divergence in wages between inmates and non-inmates after incarceration. These comparative analyses suggest that, all else equal, wage growth for ex-inmates is stunted to some degree compared to similarly situated men who do not experience incarceration. We can not determine with these data whether the post-release difference in wages varies by race. However, if we assume that incarceration affects wage growth for both whites and blacks relative to non-inmates, as previous research has suggested with survey data (e.g. Western 2002), we would expect wage divergence after prison between inmates and similarly situated men, regardless of race. At the same time, the patterns in Table 2 indicate that *among ex-inmates*, wage disparities between blacks and whites increase with time after release from prison, indicating comparative disadvantage for black ex-inmates.

CONCLUSIONS

The expansion of the U.S. criminal justice system may represent the greatest public policy intervention in the lives of the American poor since the late 20th century. Despite declines in violent crime through the1990s, the prison population continued to escalate. Increased criminalization of property crimes and drug offenses has generated a population of inmates that is increasingly defined by race and class. A clear majority of low-skill minority men will spend at least part of their lives in state custody. To better understand the impact of incarceration on labor market experiences of those most at risk, we explored whether incarceration affects wage trajectories of low skill men, and whether the impact of incarceration

varied by race. Drawing on a unique collection of longitudinal administrative data on earnings and incarceration history for a cohort of inmates in Washington State, we find evidence that wage trajectories diverge for blacks and whites after release from prison. Comparative analyses with non-inmates also provide some indication of wage trajectories in the absence of incarceration: compared to inmates, non-inmates experience greater wage growth with age. Thus, our research points not only to the negative effect of incarceration on earnings over the life course, but also to the compound disadvantage faced by black relative to white ex-inmates.

Our finding of racial differences in the effects of incarceration on wage growth is generally consistent with perspectives on the intensification of racial stigma for black ex-inmates. The combined effects of racial minority status and criminal record may interact to comparatively disadvantage blacks (Pager 2007). The intensification of stigma generally emphasizes demand-side mechanisms of employer allocation of resources or discrimination. That is, because black ex-inmates confirm multiple dimensions of criminal stereotypes, employers may more readily discriminate against blacks with criminal records than white ex-inmates. Racial differences in the stigma of incarceration may lead to outright disadvantage in the hiring process (Pager 2003, 2007), leading to lower employment stability for blacks after release from prison, or to other employment decisions such as denial of promotion or lower starting wages, which would relegate blacks to lower earning profiles.

The interaction between race and criminal record may influence wage trajectories via supply-side mechanisms as well. Furthermore, employer actions and employee perceptions and attitudes about work are likely interrelated in complex ways. Given the perception of racial discrimination, black ex-inmates may have lower attachment to or greater discouragement with legitimate work. The discouraged worker effect may be especially prevalent among low-skilled

workers in the service economy, where minority workers may experience "cultural dislocations" when interacting with the "upper-middle-class white world" (Bourgois 1995). In his ethnography of drug dealers in Spanish Harlem, Bourgois (1995: 115) notes that many tried to exit the drug world and search for legitimate employment, and that "service work in professional offices is the most dynamic place for ambitious inner-city youths to find entry-level jobs if they aspire to upward mobility." However, not only are low-skilled minorities typically deficient in the human capital necessary for upward mobility in many service jobs, they often experience disadvantage in cultural capital: the norms of high-rise culture often directly contradict the norms of inner-city street life.

Although we are not able to observe directly the mechanisms by which black ex-inmates experience slower wage growth than white ex-inmates, we find that previous work experience does seem to explain some, but not all, of the difference in black-white wage trajectories. Recent research isolates work experience as the principal explanation for black-white divergence in wages over the life course (Antecol and Bedard 2004), but our results suggest that wage divergence exists net of any differences in accumulated employment experience (in UI-covered jobs) for blacks and whites. The intensification of racial stigma for black ex-inmates may be less captured by employment instability than the allocation of wages or the relegation of black ex-inmates to jobs with less potential for wage growth.

We should note, however, that our measure of work experience does not necessarily capture job tenure. It may be that white ex-inmates are more likely than blacks to stick with one job and reap the benefits that tenure may afford, such as promotion, seniority, and greater wage growth. If we were able to observe tenure precisely, we might be able to explain a greater proportion of the gap in black and white earnings growth, before and after incarceration.

In addition to racial variation in the effects of incarceration on wage trajectories, we find that black ex-inmates receive fewer returns to prior work experience than whites. Given the importance of cumulative employment experience for wage growth over the life course, this finding is cause for concern and warrants further investigation. We caution, however, that our measure of work experience is a rough approximation of prior employment and may be capturing some unobserved heterogeneity in the nature of work experience for blacks and whites. For instance, the interaction between race and work experience may be a function of racial differences in job tenure, length of unemployment spells, or the level of employment experience. Future research should explore the heterogeneity in employment experiences for blacks and whites to better understand the dynamics of racial inequality in wage growth over the life course.

Despite these unanswered questions, this study broadens our understanding of how and why wage disparity changes over the work lives of blacks and whites by drawing further attention to the role of the prison expansion for contemporary racial inequality. Wages are a key determinant of the overall economic well being of disadvantaged segments of the population, and our findings suggest that both black and white ex-inmates experience lower wage growth than comparable men who do not have contact with the criminal justice system.

Our research joins a growing number of studies that implicate the criminal justice system in the persistence and/or exacerbation of racial inequality (Western 2006; Pettit and Western 2004). Perhaps the most striking characteristic of the criminal justice system in modern time is the disproportionate risk of imprisonment by race. Disproportionate minority contact with the criminal justice system exposes a much greater proportion of blacks to the negative labor market consequences of incarceration, leading to the intensification and accumulation of disadvantage relative to whites. Insofar as incarceration disrupts important life course transitions in

employment (Western 2002), differential risk of incarceration by race can contribute to divergence in wages for blacks and whites over the life course. Furthermore, not only are blacks at higher risk for experiencing the negative effects of incarceration than whites, our results suggest that *among inmates*, the experience of incarceration varies by race, thereby compounding the disadvantaged faced by blacks.

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Table 1. Descriptive statistics for Black and White Male Inmates in Washington State, 1998-2002 (cohort aged 18-24 in 1988)

	Blacks	Whites
Mean wage ($1995)	8.14	9.15
First observed wage	5.44	5.35
Last observed wage	9.81	11.77
Work experience (of wage sample)	46.38%	54.80%
Age (in 1988)	20.73	20.76
Mean length of follow-up, post-release	13.95	13.65
Mean sentence length	6.41	6.13
Offense type		
Violent	39.72	40.81
Drug	44.65	20.00
Property	14.78	36.03
Other	0.85	3.16
Work release	36.06	43.00
Education		
Less than HS	27.18	25.32
HS/GED	57.04	60.01
Some college	5.92	3.16
Missing	9.86	11.51
Industry (last job)		
Construction	9.29	22.62
Manufacturing	10.85	15.94
Transportation	4.51	3.56
Wholesale Trade	3.94	4.42
Retail	24.79	18.92
Agriculture/Mining	1.27	5.01
Finance/Pub. Admin.	2.11	1.67
Service	43.24	27.86
N	710	2215

Table 2. Multilevel Regression of Black and White Log Hourly Wage Trajectories, 1988-2002 (Washington Male Inmates aged 18-24 at 1988)

	Model 1		Model 2		Model 3	
	B	**SE**	**B**	**SE**	**B**	**SE**
Fixed Effects						
Level 1 (time variant)						
Intercept	1.307***	.014	1.200***	.013	1.194***	.013
Time:						
Age since 1988	.026***	.002	.023***	.002	.023***	.002
Quarters since incarceration	.003***	.001	.002***	.0003	.003***	.001
Quarters since incarceration * Black					-.002*	.001
Previous work experience			.257***	.007	.268***	.012
Previous work experience * Black					-.056**	.025
Year	.044***	.002	.048***	.002	.048***	.002
Industry[a]:						
Construction	.383***	.011	.379***	.005	.379***	.010
Manufacturing	.171***	.009	.164***	.005	.164***	.008
Transportation	.227***	.016	.221***	.009	.221***	.015
Wholesale/Trade	.095***	.013	.091***	.008	.092***	.013
Retail	-.047***	.008	-.048***	.005	-.048***	.007
Agriculture/Mining	.111***	.013	.107***	.008	.107***	.013
Finance/Pub. Admin	.066**	.024	.068**	.023	.068**	.023
Level 2 (time constant)						
Black	-.067***	.010	-.048***	.009	-.018	.011
Education[b]:						
Some college	.089***	.021	.083***	.022	.081***	.021
High school/GED	.050***	.010	.038***	.010	.038***	.096
Missing education	.066***	.016	.051**	.015	.052**	.015
Offense type[c]:						
Drug	.007	.011	.008	.010	.007	.010
Property	-.026**	.010	-.020**	.010	-.021**	.010
Other	.020	.027	.013	.026	.010	.023
Quarters incarcerated	-.007***	.002	-.001	.002	-.001	.002
Work release	.010	.009	.006	.008	.006	.008
Variance Components						
Within-person variance	.318***		.316***		.316***	
Intercept	.210***		.197***		.197***	
N (persons)	2925		2925		2925	
N (quarters)	51530		51530		51530	
Deviance	34220.10		33067.31		22062.32	

Notes:

SE represents robust standard errors

* p < .05; ** p < .01; *** p < .001 (two-tailed)

[a] Referent is service industry

[b] Referent is less than high school

[c] Referent is violent offense

Table 3. Multilevel Regression of Wage Trajectories 1988-2002, GED Match Sample (Male Inmates and Non-inmates aged 18-24 in 1988)

Fixed Effects	**B**	**SE**
Level 1 (time variant)		
Intercept	1.226***	.028
Time:		
Age since 1988	.016***	.003
Quarters since incarceration	.002*	.001
Quarters since incarceration x Inmate	-.004**	.001
Previous work experience	.387***	.026
Year	.057***	.004
Industry[a]:		
Construction	.290***	.014
Manufacturing	.131***	.012
Transportation	.180***	.023
Wholesale/Trade	.053**	.015
Retail	-.041***	.011
Agriculture/Mining	.082***	.017
Finance/Pub. Admin	.077**	.026
Level 2 (time constant)		
Inmate[b]	-.056***	.015
Quarters incarcerated	.002	.001
Variance Components		
Within-person variance	.234***	
Intercept	.489***	
N (persons)	1850	
N (quarters)	42139	
Deviance	7122.33	

Notes:

SE represents robust standard errors

* p < .05; ** p < .01; *** p < .001 (two-tailed)

[a] Referent is service industry

[b] Referent is non-inmate match sample

Figure 1. Hourly Wage (unadjusted) Before and After 1st Incarceration, Washington State Male Inmates 1988-2002 (Aged 18-24 in 1988)